

# Reexamining Hygiene in Modern Hospitals

We Don't Do Very Well!

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# HAIs in Perspective

## The Problems

- Antibiotics in sick people housed together promote transmission of antibiotic-resistant pathogens
- Most HAIs occur within 2-4 days of admission
- It has been estimated that 1/3 of HAIs are linked to professional errors and cleanliness issues



# Objectives

- Define the reason hospitals are at great risk for infections
- List the traditional approaches and indicate their limitations
- Describe new concepts of infection control in evaluation



# *Clostridium difficile* a Unique Hospital Problem



- *C. difficile* spores are shed from both symptomatic and asymptomatic patients
- Spores can survive many months on surfaces and are not destroyed by standard disinfectants
- ~40% of health care workers carry spores
- 15% of patients are colonized by the organism

# Our Contaminated World



- **Outside the hospital**  
CDC: >1.5 million cases of environmentally contracted notifiable diseases in the U.S. each year with >15,000 deaths
- **Inside the hospital**  
>1.7 million healthcare-associated infections (HAIs) or 4.5 infections/100 hospital admission (1.7 million nationally) with 99,000 deaths (6%) making HAIs 6<sup>th</sup> leading cause of death

# Traditional Methods of Infection Control

- Hand washing reduces person-to-person contact spread of microbes in hospital but is difficult to enforce
- This does not address infections being carried in by patients which assure a hospital reservoir even with total cleanliness and high levels of hygiene
- Cleaning of rooms is done by poorly trained people who are told to turn the rooms over quickly



## Modern Methods of Infection Control



- We have to focus on both endogenous and exogenous pathogens
- Room cleaning needs to be performed by dedicated personnel
- UV radiation, gaseous plasma (hydroxyl and hydroperoxyl free radicals) or hydrogen peroxide vapor may help
- Antibiotic stewardship
- The Hospital Microbiome Project takes an ecological approach to improve intestinal colonization resistance

## Conclusions: How to Modernize



- Require an accurate diagnosis of CDI and stop treatment if found negative
- Assume all patients and hospital personnel are *C. difficile*-positive
- Require that room cleaning be effective and that frequent and effective hand washing are performed
- Stay tuned to ongoing studies of disinfection of hospital environments